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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/775,515	02/10/2004	Jack Oon Chu	YOR920010308US2 (16315A)	1045
23389	7590	10/12/2004	EXAMINER DANG, PHUC T	
SCULLY SCOTT MURPHY & PRESSER, PC 400 GARDEN CITY PLAZA GARDEN CITY, NY 11530			ART UNIT 2818	
			PAPER NUMBER	

DATE MAILED: 10/12/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/775,515	Applicant(s) CHU ET AL.	
	Examiner PHUC T DANG	Art Unit 2818	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on Preliminary Amendment filed on February.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-13 is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-13 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 10 February 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 021004.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

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DETAILED ACTION

1. This application is a divisional of 10/838,892 filed on April 20, 2001 (U.S. Patent No. 6,750,119).

Preliminary Amendment

2. Preliminary Amendment filed on February 10, 2004 is acknowledged and considered.

In Preliminary Amendment, Applicant cancel claims 14-59 and claims 1-13 are remained the application for examination.

Claims 1-13 are currently pending in the application.

Oath/Declaration

3. The oath/declaration filed on February 10, 2004 is acceptable.

Information Disclosure Statement

4. The office acknowledges receipt of the following items from the applicant:

Information Disclosure Statement (IDS) filed on February 10, 2004.

Specification

5. The specification has been checked to the extent necessary to determine the presence of all possible minor errors. However, the applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Claim Rejections - 35 USC § 102

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

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This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(f) or (g) prior art under 35 U.S.C. 103(a).

6. Claims 1-2 and 7 are rejected under 35 U.S.C. 102 (b) as being anticipated by Satoh et al., hereafter "Satoh" (U.S. Patent No. 6,403,976 B1).

Satoh discloses a method for forming an alloy layer of silicon carbon on a silicon containing substrate comprising the steps of:

placing a wafer (101, Fig. 3 (a)) having a single crystalline silicon containing surface (105 and 106, Fig. 3 (a)) into a UHV-CVD chamber at a pressure below 10^{-8} Torr,

heating the silicon containing substrate (105 and 106, Fig. 3 (a)) to a temperature in the range of about 475° - 850° C, and

flowing a silicon containing gas and a carbon containing gas (Fig. 3 (b)) at a pressure in the range from about 1 to 50 millitorr over the silicon containing substrate (101, Fig. 3 (a)) whereby the silicon carbon alloy layer (Fig. 3 (b)) is formed [col. 5, lines 34-43].

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Satoh in view of Cabral, Jr. et al., hereafter "Cabral" (U.S. Patent No. 5,634,973).

Satoh discloses all the features of the claimed invention as discussed above, but does not disclose the carbon containing gas includes gas molecules having at least two carbon atoms.

Cabral. However, discloses the carbon containing gas includes gas molecules having at least two carbon atoms [col. 3, lines 38-41].

It would have been obvious to one having ordinary skill in the art at the time the invention was made to apply the teaching of Cabral to Satoh discussed above such that the carbon containing gas includes gas molecules having at least two carbon atoms for a purpose of improving a process an alloy layer of silicon carbon on a silicon containing substrate.

8. Claims 4-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Satoh in view of Lockemeyer (U.S. Patent No. 5,929,259).

Satoh discloses all the features of the claimed invention as discussed above, but does not disclose the oxygen in said silicon carbon layer is less than 1×10^{17} atoms/cc and the carbon containing gas is selected from the group of molecules containing unsaturated double or triple carbon-carbon bonds.

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Lockemyer, however, discloses the oxygen in said silicon carbon layer is less than 1×10^{17} atoms/cc and the carbon containing gas is selected from the group of molecules containing unsaturated double or triple carbon-carbon bonds [col. 11, lines 61-col. 12, lines 4].

It would have been obvious to one having ordinary skilled in the art at the time the invention was made to apply the teaching of Lockemeyer to satioh discussed above such that the oxygen in said silicon carbon layer is less than 1×10^{17} atoms/cc and the carbon containing gas is selected from the group of molecules containing unsaturated double or triple carbon-carbon bonds for a purpose of improving a process an alloy layer of silicon carbon on a silicon containing substrate.

9. Claims 6 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Satioh in view of Schneider et al., hereafter "Schneider" (U.S. Patent No. 5,477,023).

Satioh discloses all the features of the claimed invention as discussed above, but does not disclose the carbon containing gas is selected atom the group consisting of ethylene, acetylene, propylene, butylene, pentene and mixtures and the carbon atom from carbon containing gas is incorporated into the alloy crystal lattice substitutionally whereby the carbon is electrically active.

Schneider, however, discloses the carbon containing gas is selected atom the group consisting of ethylene, acetylene, propylene, butylene, pentene and mixtures and the carbon atom from carbon containing gas is incorporated into the alloy crystal lattice substitutionally whereby the carbon is electrically active [col. 8, lines 26-30].

It would have been obvious to one having ordinary skilled in the art at the time the invention was made to apply the teaching of Schneider to satioh discussed above such that the

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carbon containing gas is selected from the group consisting of ethylene, acetylene, propylene, butylene, pentene and mixtures and the carbon atom from carbon containing gas is incorporated into the alloy crystal lattice substitutionally whereby the carbon is electrically active for a purpose of improving a process an alloy layer of silicon carbon on a silicon containing substrate.

10. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Satoh in view of Schulz et al., hereafter "Schulz" (U.S. Patent No. 5,208,102).

Satoh discloses all the features of the claimed invention as discussed above, but does not disclose the flowing gases contain less than 1 ppm of contaminant gases containing oxygen.

Schulz, however, discloses the flowing gases contain less than 1 ppm of contaminant gases containing oxygen [col. 4, lines 30-35].

It would have been obvious to one having ordinary skill in the art at the time the invention was made to apply the teaching of Schulz to satoh discussed above such that the flowing gases contain less than 1 ppm of contaminant gases containing oxygen for a purpose of improving a process an alloy layer of silicon carbon on a silicon containing substrate.

11. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Satoh in view of Sato et al., hereafter "Sato" (U.S. Patent No. 6,180,497).

Satoh discloses all the features of the claimed invention as discussed above, but does not disclose the step of placing a wafer into the UHV CVD chamber includes placing a plurality of wafers.

Sato, however, discloses the step of placing a wafer into the UHV CVD chamber includes placing a plurality of wafers [col. 7, lines 4-10].

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It would have been obvious to one having ordinary skilled in the art at the time the invention was made to apply the teaching of Sato to satioh discussed above such that the step of placing a wafer into the UHV CVD chamber includes placing a plurality of wafers for a purpose of improving a process an alloy layer of silicon carbon on a silicon containing substrate.

12. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Satioh in view of Jansen (U.S. Patent No. 4,974,543).

Satioh discloses all the features of the claimed invention as discussed above, but does not disclose the step of flowing includes flowing a dopant containing gas selected atom the group consisting of diborane, phosphine, arsine and mixtures thereof.

Janse, however, discloses the step of flowing includes flowing a dopant containing gas selected atom the group consisting of diborane, phosphine, arsine and mixtures thereof [col. 7, lines 26-58].

It would have been obvious to one having ordinary skilled in the art at the time the invention was made to apply the teaching of Jansen to satioh discussed above such that the step of flowing includes flowing a dopant containing gas selected atom the group consisting of diborane, phosphine, arsine and mixtures for a purpose of improving a process an alloy layer of silicon carbon on a silicon containing substrate.

13. Satioh discloses the claimed invention except for the process parameters as claimed in claims 12-13. However, the selection of the claimed process parameters would have been obvious to one having ordinary skill in the art at the time the invention was made to perform the silicon carbon alloy has an oxygen concentration of less than 1×10^{17} atoms, since it is well

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settle that when the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. In re Aller, 105 USPQ 233. grounded during use of the fiducial mark body as disclosed in claim 18.

Conclusion

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Phuc T. Dang whose telephone number is (571) 272-1776. The examiner can normally be reached on 8:00 am-5:00 pm.

15. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David C. Nelms can be reached on (571) 272-1787. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9306 for regular communications and After Final communications.

16. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

Phuc T. Dang

PD



Primary Examiner

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